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**Sports, exercise and health science**  
**Standard level**  
**Paper 1**

Friday 17 May 2019 (afternoon)

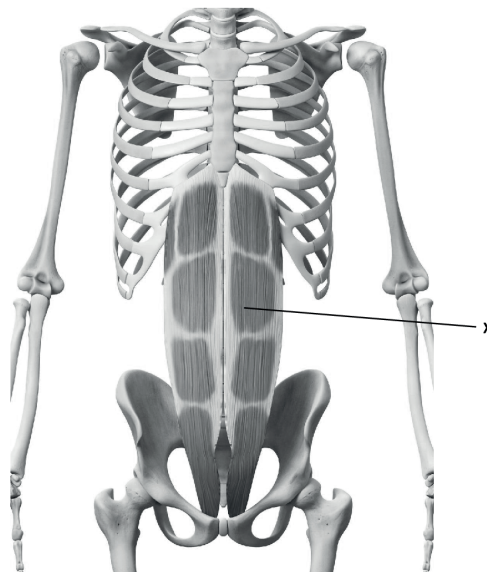
45 minutes

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**Instructions to candidates**

- Do not open this examination paper until instructed to do so.
- Answer all the questions.
- For each question, choose the answer you consider to be the best and indicate your choice on the answer sheet provided.
- The maximum mark for this examination paper is **[30 marks]**.

1. Which are the four types of bones?
  - A. Short, periosteum, long, regular
  - B. Long, short, irregular, flat
  - C. Compact, irregular, flat, long
  - D. Flat, short, compact, regular
2. An athlete's broken leg is immobilized in a cast. Which muscle characteristic causes difficulty in walking after the prolonged inactivity?
  - A. Extensibility
  - B. Elasticity
  - C. Atrophy
  - D. Hypertrophy
3. What is the muscle labelled X in the diagram?



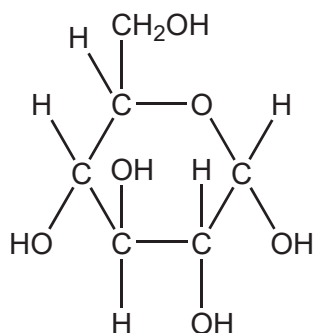
[Source: ID 45575799 © Sebastian Kaulitzki | Dreamstime.com]

- A. Abdominus rectus
- B. External obliques
- C. Erector spinae
- D. Iliopsoas

4. What is vital capacity?
- A. Inspiratory reserve volume plus total lung capacity
  - B. Total lung capacity minus residual volume
  - C. Tidal volume plus inspiratory reserve volume
  - D. Residual volume minus expiratory reserve volume
5. Which component of blood is greatest by volume?
- A. Electrolytes
  - B. Plasma
  - C. Erythrocytes
  - D. Leucocytes
6. How does an increased erythrocyte level benefit an athlete?
- A. By increasing the oxygen carrying capacity of the blood
  - B. By decreasing the capacity of the blood to clot in case of an injury
  - C. By increasing the ability of the body to fight infection
  - D. By decreasing viscosity of the blood
7. What type of blood is pumped by each of the blood vessels listed?

	<b>Vena cava</b>	<b>Pulmonary artery</b>	<b>Pulmonary vein</b>	<b>Aorta</b>
A.	oxygenated	deoxygenated	deoxygenated	oxygenated
B.	deoxygenated	oxygenated	deoxygenated	deoxygenated
C.	deoxygenated	deoxygenated	oxygenated	oxygenated
D.	oxygenated	deoxygenated	oxygenated	deoxygenated

8. How does the heart meet the demand for oxygenated blood during physical activity?
- Increasing cardiac output, decreasing stroke volume, increasing heart rate
  - Decreasing cardiac output, decreasing stroke volume, decreasing heart rate
  - Increasing cardiac output, increasing stroke volume, increasing heart rate
  - Decreasing cardiac output, increasing stroke volume, increasing heart rate
9. What does diastolic blood pressure measure?
- The force exerted by blood on arterial walls during ventricular contraction
  - The force exerted by blood on venous walls during ventricular relaxation
  - The force exerted by blood on arterial walls during ventricular relaxation
  - The force exerted by blood on venous walls during ventricular contraction
10. Which molecule is represented by the diagram below?



- Glucose
- Fat
- Amino acid
- Protein

- 11.** What is the chemical composition of a protein molecule?
- A. Glycerol and three fatty acids
  - B. Only carbon, hydrogen and oxygen
  - C. Only carbon and oxygen
  - D. Carbon, hydrogen, oxygen and nitrogen
- 12.** What is the correct order (greatest to least) for the amount of energy contained in 100 g of each body fuel?
- A. Carbohydrate, protein, lipid
  - B. Lipid, carbohydrate, protein
  - C. Protein, carbohydrate, lipid
  - D. Lipid, protein, carbohydrate
- 13.** What type of process is lipolysis?
- A. Aerobic anabolism
  - B. Anaerobic anabolism
  - C. Aerobic catabolism
  - D. Anaerobic catabolism
- 14.** Which energy system is the most rapid to resynthesize ATP?
- A. Anaerobic glycolysis
  - B. Aerobic glycolysis
  - C. Lactic acid
  - D. Creatine phosphate

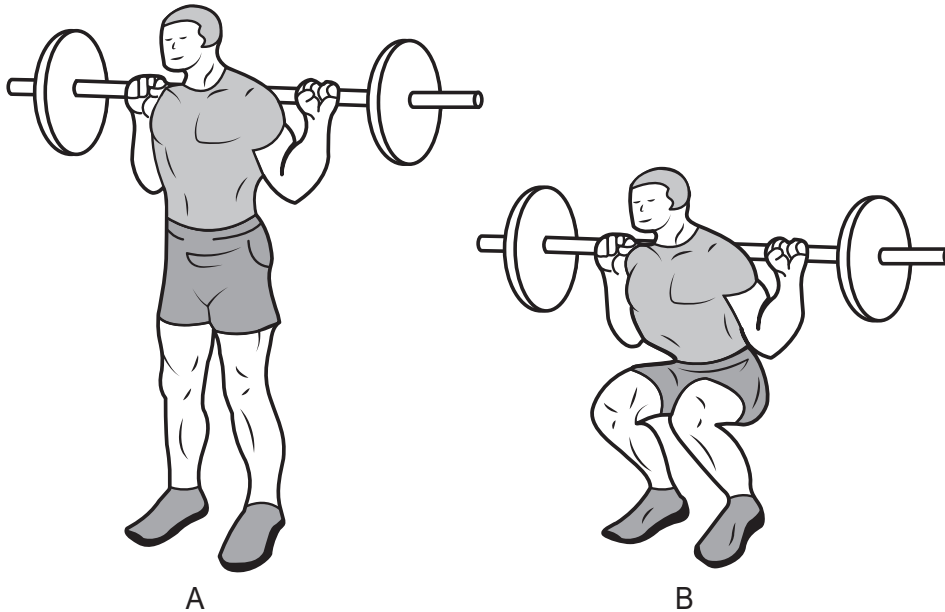
15. A skier, when snowplowing, turns the soles of their feet outwards. What action are the feet performing?



[Source: adapted from [www.mechanicsofsport.com](http://www.mechanicsofsport.com)]

- A. Extension
- B. Circumduction
- C. Inversion
- D. Eversion

16. Which type of contraction occurs in the rectus femoris while performing a squat (moving from position A to B)?

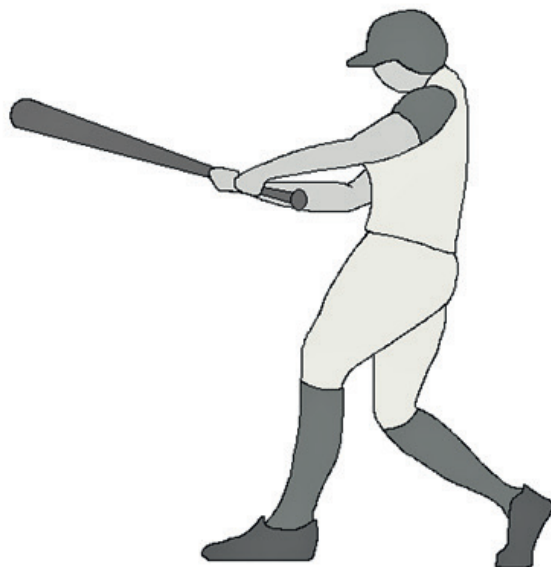


[Source: adapted from “parallel squat” by Everkinetic, <https://commons.wikimedia.org/wiki/File:Squats.svg>. Licensed under a Creative Commons Attribution-ShareAlike 3.0 Unported license. <https://creativecommons.org/licenses/by-sa/3.0/>.]

- A. Isometric
  - B. Isotonic eccentric
  - C. Isotonic concentric
  - D. Isokinetic eccentric
17. Which is an example of a second-class lever?
- A. The ankle joint during plantar flexion
  - B. The elbow during flexion
  - C. The knee during extension
  - D. The hip during abduction

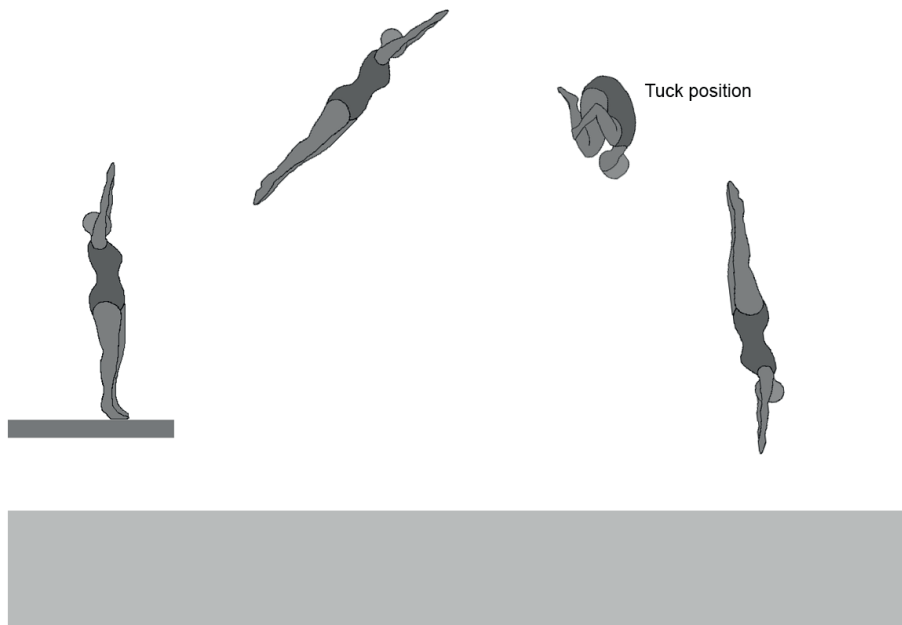


18. Which of Newton's laws predicts the increase in acceleration of the swing when a child uses a lighter baseball bat?



- A. First
- B. Second
- C. Third
- D. First and second

19. Why does a diver use the tuck position?



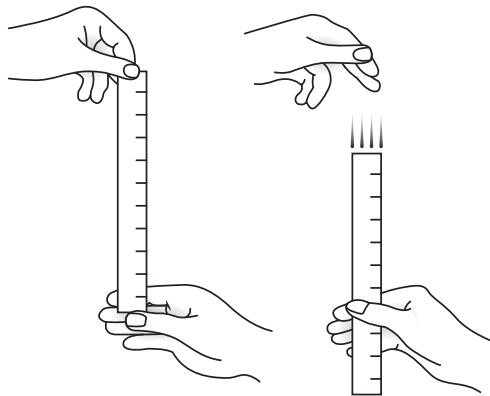
[Source: used with permission]

- A. To reduce spin by decreasing moment of inertia
  - B. To reduce spin by increasing moment of inertia
  - C. To increase spin by decreasing moment of inertia
  - D. To increase spin by increasing moment of inertia
20. What is the sequence of a motor unit signal travelling from the brain to the muscle?
- A. Synapse, axon, cell body, dendrite, motor end plate
  - B. Synapse, dendrite, cell body, axon, motor end plate
  - C. Motor end plate, dendrite, cell body, axon, synapse
  - D. Synapse, dendrite, axon, cell body, motor end plate

**21.** Which motor skill classifications apply when an athlete runs a 100 m race?

- A. Gross, interactive, externally paced
- B. Fine, individual, internally paced
- C. Gross, coactive, externally paced
- D. Fine, coactive, internally paced

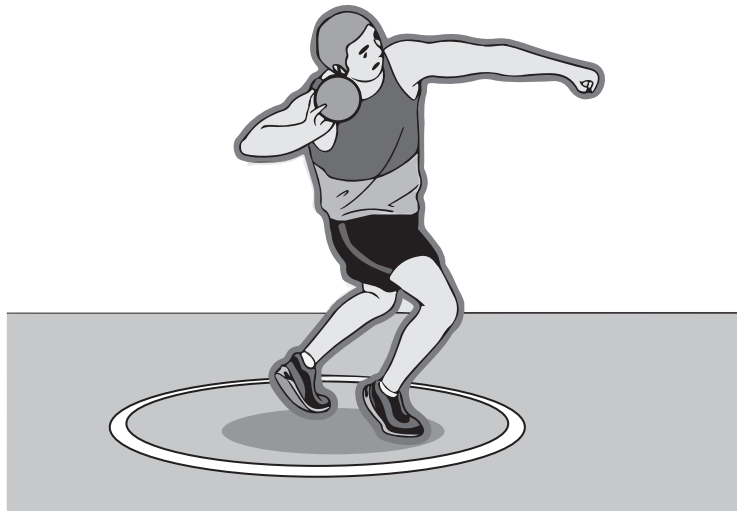
**22.** What is measured by the drop test?



[Source: © Thapos, thapos.com]

- A. Reaction time
  - B. Response time
  - C. Movement time
  - D. Coordination
- 23.** As a golfer hits the ball they feel a sharp pain in the right bicep; this is an example of which types of feedback?
- A. Knowledge of result, negative, terminal
  - B. Knowledge of result, positive, concurrent
  - C. Knowledge of performance, negative, concurrent
  - D. Knowledge of performance, positive, terminal

24. A teacher introduced fencing to a group of judo athletes. Actions in judo are initiated by the foot whereas fencing actions are initiated by the hand. The judo athletes were slow to master the fencing skills. What learning transfer took place?
- A. Positive
  - B. Negative
  - C. Bilateral
  - D. Stage to stage
25. A coach is teaching a large group of students in a potentially dangerous situation, for example shot put training. What is the safest teaching style to use?



[Source: adapted from [www.wikihow.com](http://www.wikihow.com)]

- A. Command
- B. Reciprocal
- C. Problem-solving
- D. Mental

- 26.** What can be represented by error bars on graphs?
- A. Reliability of data
  - B. One standard deviation of data
  - C. Percent change of data
  - D. Validity of data
- 27.** What is coefficient of variation?
- A. The ratio of the standard deviation to the mean expressed as a percentage
  - B. The sum of the standard deviation and the mean
  - C. The ratio of the mean to the standard deviation expressed as a percentage
  - D. The sum of the standard deviation subtracted from the mean
- 28.** Which terms apply to the use of the multistage fitness test to evaluate the muscular power of a 100m swimmer?
- A. Reliable and valid
  - B. Not reliable and not valid
  - C. Not reliable but valid
  - D. Reliable and not valid
- 29.** Which fitness component is most important when a soccer player dribbles a ball around opponents while maintaining their balance?
- A. Muscular endurance
  - B. Aerobic capacity
  - C. Flexibility
  - D. Agility

- 30.** Why would an athlete work at different heart rate training zones rather than a maximum heart rate zone?
- A. To avoid overreaching
  - B. To increase the number of fast-twitch fibres
  - C. To target specific training adaptations
  - D. To reduce excess post-exercise oxygen consumption (EPOC)
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